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"An educational tool, entertainment system or search tool"

THIS INVENTION relates to an educational tool, entertainment system or search tool for domestic or industrial applications. More particularly, the invention involves the application of automatic identification systems such as radio frequency (RF) identification, barcodes, RF/microwave/millimetrewave transceivers, sonic, utrasonic and optical (including infrared and ultraviolet) transmission systems in educational tools, search tools and entertainment systems such as themed areas or toys.

The ability to impart educational information or provide entertainment can be enhanced by introducing a level of interactivity between an individual who is to be educated or entertained and the educator or entertainer. However, such an enhanced educational or entertainment experience has hitherto only been possible or readily achieved using human educators or entertainers.

It is an object of the present invention to overcome this problem.

Accordingly, one aspect of the present invention provides an educational tool, search tool or entertainment system comprising one or more identification means each associated with an item, a reader for detecting and interrogating the identification means to identify the item associated therewith and processing means operable to react in a predetermined manner to the identification of a detected item.

A further aspect of the present invention provides a method of providing entertainment or educational information or searching comprising the steps of: providing one or more items with detectable identification means; detecting an

item; interrogating the item and identifying the item from the identification means; and providing information in response to the identification of an item.

A further object of the present invention is to seek to provide a search tool for locating tagged items in a domestic or industrial environment.

In order that the present invention may be more readily understood, it will now be described with reference to the accompanying figure which shows a schematic illustration of a system embodying the present invention.

Referring to Figure 1, a system embodying the present invention consists of a number of identification labels 1 each associated with a particular item and a reader 2 for detecting and interrogating the labels to identify the item associated therewith.

The identification labels 1 may be but are not limited to:

1.   Passive/active radio frequency transponders operating in the near field / far field region.

2.   Self-contained RF (including microwave and millimetrewave), optical (including infrared and ultraviolet) or sonar transmission systems with/without on/off functions.

3.   Barcodes.

4.   Wired / contact transmission sysems.

5.   Any other automatic identification system transponders.   These identification labels may be programmable or non-programmable using its reader or a stand alone programmer.   The label may contain information pertaining to the identification of the item or description of the item.

The reader 2 may be but is not limited to the following components: a reading device 3 capable of reading the information from the chosen identification labels 1 transponders;   an information processing unit 4;   an information storage unit 5;   and a user interface 6.   These different components may be separate or some of the functions may be integrated to form a compact unit.   In its simplest form, the reader 2 consists solely of the device for reading identification labels 1 and the function of the other components can be carried out by an associated device such as a personal computer.

The information processing unit 4 receives information from the reading device and processes the information to execute the functions defined in software/firmware present in the information processing unit 5 and pass the resultant information to the user interface 6.   The reader 2 may also receive instructions through the user interface 6 and pass such instructions on to the or each label 1 to program one or more of the labels in a specified manner.

The information passed to the user interface may, for example, be information held in the information held in the information storage unit 5 which may be configured as a memory including a look-up table.   Thus, if a label 1 is identified as being "tag 3", then the look-up table in the unit 5 is instructed by the processing unit 4 to output information concerning "tag 3" to the user interface 6.

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The user interface 6 may include but is not restricted to a keyboard 9, a video display 7 and an audio device 8 to display or announce the information as required in the chosen application. The user interface 6 can accept data input through the keyboard interface 9. The user interface may also be provided with a standard P.C. interface. The reader 2 may also include a response activation unit 10. The response unit 10 incorporates a mechanism operable to react in a predetermined manner to information from the information processing unit. The mechanism may be mechanical in nature but can also emit a visual or audible signal. The response unit 10 need not necessarily be part of the reader 2 but can be associated therewith. For example, the response unit 10 could be located within a toy as part of a mechanism in the toy, the reader 2 being capable of sending a signal to the response unit 10 to activate the response unit 10.

In one embodiment of the system, a plurality of items are each tagged with a respective label 1. When brought to the reader 2, the reader 2 detects the label and reads identification information held on the label and announces, through the audio device 8, the name of the item, the name of the item being the information corresponding to the item tagged with that label 1.

In a second embodiment, the reader 2 can give a brief description of the item tagged with the label. The reader 2 can also display such information if equipped with a video display 7.

In a third embodiment, the reader 2 can be configured in the form of a kiddy teacher toy (i.e. kiddy Professor) and announce or display the identity or type of an item or can announce that there is more than one item.

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In a fourth embodiment, the reader 2 can count and announce and/or display the number or items. This can also be used as a tutor to teach spelling by asking children to bring letters (each of which is tagged with a separate label 1) one by one in the correct order and giving necessary instructions.

In a fifth embodiment, the parents or a teacher can program the labels 1 and the reader 2 suitably and attach the labels to various household items and give a portable reader 2 to a child to explore by finding, identifying and learning about the household items.

In a sixth embodiment, the reader 2 is in the form of or contained within a toy and the labels 1 can be used as a switch to direct the reader 2 to activate an appropriate mechanism in the response activation unit 10 in the toy.

In a seventh embodiment, household or industrial items are tagged with labels having identification codes specific to each item. Cross-referencing information linking a particular item to a particular identification code held on a label is stored in the information storage unit 5 of the reader 2. A user, who wishes to search for and locate an item, can enter a desired tagged item or identification code through the user interface unit 6 and move around with the reader 2 to obtain responses from tagged items. Once the reader 2 detects the identification code of the item being searched for, the reader 2 will provide response via the response activation unit 10. Thus, the system provides a search tool with which a user can search for and locate tagged items in both domestic and industrial environments.

In an eighth embodiment, the reader includes one or more dedicated counters which are incremented each time a particular label is read by the reader 2. Thus, a count of the number of times a particular label 1 has been

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read (by the reader) is held by the reader 2. The response of the reader can vary according to the number of times the label 1 has been read. For example, a label 1 is attached to or hidden in a toy shark and a reader 2 is hidden in or attached to a kiddy teacher. When the shark is first brought into the reading field of the teacher, the teacher will announce "It lives in the sea". A counter in the reader 2 will be incremented to show that the label 1 has been read once. The next time the toy shark is brought into the reading field of the teacher, the teacher will announce "It is greyish white in colour". The counter will be incremented again to show that the label 1 has been read twice. The next time the shark is brought near the teacher again, the teacher will announce "It will attack human". The counter will be incremented to show that the label 1 has been read three times. Thus, the responses from the reader 2 can be programmed to vary in accordance with the number of times that a particular label 1 has been read so that different information is imported to a user each time.

In another embodiment, the information concerning the number of times a particular label 1 had been read can be stored in the label 1 instead of the reader 2.

This concept can be extended to further innovative applications using the systems. The labels 1 can be used to tag any items of interest. When the label is within the reading range, the reader will identify the label. The reader 2 can then: announce the name of the item; pronounce the name of the item; display any other relevant information of the item; and detect and count the total number of labels 1 within the reading range.

The system can be used as an educational tool for children. The labels 1 can be attached to or contained in small soft toys. The information held in the

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memory 5 of the reader 2 on that particular toy is made available when the label 1 is detected and identified by the reader 2. The reader 2 can be attached to or contained in a big toy (i.e. a kiddy Professor). The child can then take toys of their choice towards the reader 2. Once within reading range, the reader 2 will announce and/or display the relevant information of that toy. When more than one toy is brought near the reader 2, the reader 2 will announce and/or display the total number of toys within its reading range. In this way, the child will learn to pronounce, spell and count. The reader 2 can also be set such that there is a revision test for the child. The reader 2 will announce and/or display the information of a toy that it previously detected and the child has to bring the relevant toy to the reader 2. The reader will indicate if the child answers correctly. Alternatively, or in addition thereto, the reader 2 will announce the name of the toy and the child will be asked to spell.

In another embodiment, a portable reader 2 is provided and a user can attach or contain a label 1 in any item of their interest. The information on the item tagged by the label 1 is then entered into the memory 5 by the user interface 6, thereby updating in the reader 2. With the portable reader 2, the user can move the reader 2 towards any tagged item. The reader 2 will then announce and/or display the information on any item tagged by a label 1 once the label 1 has been detected. This application is suitable for a child to learn about new things in its environment (i.e. the names of different items in a household). This application may also serve as an educational tool for adults, for example, electronically labelling the different trees in a botanical garden will enable adults to learn more about the trees.

The labels 1 can be used to act as means to activate an "ON" or "OFF" switch in the reader 2. In this case, a toy having an electrical, mechanical, video or audio mechanism will incorporate the reader 2. Once an appropriate

label 1 is brought into the reading range of the reader 2, the toy will switch on or off a pre-designated mechanism. This application finds use in educational toys for children. For example, to illustrate an "ON" switch label, a toy carrot can contain a label 1 and a toy rabbit can contain the reader 2. When the toy carrot is brought into the reading range of the toy rabbit, a mechanical mechanism is switched on within the toy rabbit by the reader 2 and the toy rabbit will dance happily. Otherwise, it will remain stationary. In another example to illustrate an "OFF" switch label 1, the label is attached to or contained in a toy baby and the reader 2 in a toy mother. When the body is outside of the reading range of the toy mother, the toy mother will cry and shout "where is my baby". However, when the toy baby is brought within the reading range of the toy mother, the toy mother will remain silent. The switch can also be used in the entertainment industry. For example, in a themed area such as a haunted house, visitors entering the house would each be tagged with a unique label, the label only activating certain haunted mechanical figures containing readers 2 in the house. Thus, every individual can undergo a unique experience in the house.